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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,880	10/14/2003	Vittorio de Nora	MOL0533CON2	4861

7590 10/19/2006

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EXAMINER	
WILKINS III, HARRY D	
ART UNIT	**PAPER NUMBER**
1742	

DATE MAILED: 10/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/684,880	NORA ET AL.	
	Examiner	Art Unit	
	Harry D. Wilkins, III	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 30 August 2006.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 99-130 is/are pending in the application.

4a) Of the above claim(s) 101-106,110-117 and 122 is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 99,100,107-109,118-121 and 123-130 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 14 October 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 101-106 and 110-117 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 30 August 2006.

2. Although not indicated as such, claim 122 reads on a non-elected species, that of an "additional layer" that included coke. Therefore, claim 122 is also withdrawn from consideration.

Oath/Declaration

3. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

> The oath or declaration is defective because:
> It does not identify the mailing address of each inventor. A mailing address is an address at which an inventor customarily receives his or her mail and may be either a home or business address. The mailing address should include the ZIP Code designation. The mailing address may be provided in an application data sheet or a supplemental oath or declaration. See 37 CFR 1.63(c) and 37 CFR 1.76.
>
> It does not identify the citizenship of each inventor.
>
> It does not identify the city and either state or foreign country of residence of each inventor. The residence information may be provided on either an application data sheet or supplemental oath or declaration.

The declaration fails to provide any information other than the full name for the fourth inventor, James Jenq Liu.

Priority

4. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows:

5. Applicant has failed to include references to the prior-filed applications as the first sentence of the specification or in an application data sheet. The specification should be amended to provide references to the prior-filed applications.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 99-100, 107, 119 and 125 are rejected under 35 U.S.C. 102(b) as being anticipated by Juric et al (US 5,352,338).

Juric et al anticipates the invention as claimed. Juric et al teach (see abstract and cols. 4-10) a cathode for aluminum electrowinning, having a cathode surface on which aluminum is produced and forms a pool (layer) thereon, which is covered with a start-up layer of heavy duty aluminum foil. The aluminum foil is made to be in intimate matching contact with the cathode surface prior to preheating of the aluminum electrowinning cell.

Regarding claim 100, the cathode of Juric et al (see col. 6, lines 7-16) was made from a TiB_2-carbon composite.

Regarding claim 107, Juric et al teach (see col. 8, lines 45-50) using heavy duty aluminum foil as the start-up layer.

Regarding claim 119, Juric et al teach an aluminum electrowinning cell as claimed.

Regarding claim 125, the cathode of Juric et al included a aluminum-wettable refractory coating (TiB_2) covered with at least one start-up layer of aluminum foil. The start-up layer was covered with cryolite (a fluoride-based electrolyte with a melting point in the range of 660-760°C).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claim 108-109, 118, 120-121 and 126-128 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juric et al (US 5,352,338).

Regarding claim 108, Juric et al fail to teach the thickness of the aluminum foil layer.

It would have been obvious to one of ordinary skill in the art to have optimized the thickness of aluminum foil utilized in order to maximize the corrosion protection, while minimizing cost. One of ordinary skill in the art would have been aware that thicker layers of aluminum foil would have provided more corrosion protection because the corrosion of the cathode was caused by reaction of the cathode with the cryolite (mixed fluorides) electrolyte of the aluminum electrowinning cell. By providing a thicker aluminum layer, the time it took for the cryolite electrolyte to diffuse through the protective layer increased, thereby increasing the corrosion protection.

Since one of ordinary skill in the art was aware that more aluminum provided more protection, it would have been obvious to one of ordinary skill in the art to have provided more aluminum in order to increase the corrosion protection.

Regarding claim 109, aluminum foil spontaneously reacts with air to form a dense aluminum oxide coating on the surface, thereby preventing further corrosion of the foil. Thus, the heavy duty aluminum foil of Juric et al inherently was at least partially oxidized.

Regarding claim 118, Jurice et al teach using aluminum pellets to form a molten protective layer above the aluminum foil layer. However, one of ordinary skill in the art would have been aware that providing a single aluminum sheet was equivalent to using pellets since the aluminum became a molten layer near the end of the start-up regardless of what form the aluminum was provided in. Juric et al teach forming a 20 mm thick molten layer, however, it would have been obvious to one of ordinary skill in the art to have utilized less aluminum to reduce costs as a trade-off against less corrosion protection.

Regarding claims 120-121, Jurice et al teach using aluminum pellets to form a molten protective layer above the aluminum foil layer. However, one of ordinary skill in the art would have been aware that providing a single aluminum sheet was equivalent to using pellets since the aluminum became a molten layer near the end of the start-up regardless of what form the aluminum was provided in. The aluminum layers were electrically conductive.

Regarding claim 126, Juric et al teach (see paragraph spanning cols. 3 and 4) that coke beds placed between cathode and anode were utilized to help prevent carbon (cathode) oxidation to help prevent corrosion of the cathode. Therefore, it would have been obvious to one of ordinary skill in the art to have additionally included a coke bed above the cathode as suggested was done for preventing carbon oxidation during electrowinning start-up.

Regarding claim 127, the cell of Juric et al would inherently include side walls as was conventional for aluminum electrowinning cells. However, Juric et al do not teach extending the start-up layers up the side walls. Since the edges of the cell (i.e.-adjacent the side walls) would have also been susceptible to corrosive attack by the electrolyte, it would have been obvious to one of ordinary skill in the art to have extended the protective aluminum foil layer to a portion of the side walls to help prevent cryolite from leaking into the cathode at the edges of the cell.

Regarding claim 128, this limitation is related to the intended use of the claimed structure and is not given patentable weight. See MPEP 2114 and 2115.

10. Claims 123, 124, 129 and 130 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juric et al (US 5,352,338) in view of Townsend (US 5,028,301).

Regarding claims 123 and 124, Juric et al fail to teach that the apparatus included burners of means to generate infrared radiation for providing the heat during the preheating of the cell.

However, Townsend teaches that it was conventional in the art of aluminum electrowinning (smelting) to provide external sources of heat, such as gas burners, for providing additional heat during the process start-up phase.

Therefore, it would have been obvious to one of ordinary skill in the art to have provided an appropriate external heat source to the cell of Juric et al as taught by Townsend for the purpose of providing additional heat during the start-up of the cell.

Regarding claim 129, Juric et al is silent with respect to the composition of the anodes utilized. Townsend teaches (see col. 1) that typically anodes were made form carbon. Therefore, it would have been obvious to one of ordinary skill in the art to have made the anodes in the apparatus of Juric et al from the conventional carbon.

Regarding claim 130, Juric et al fail to expressly disclose the arrangement of the cell. However, Townsend teaches (see figure 1) the conventional arrangement for aluminum electrowinning cells that include aluminum-wettable cathodes in a drained configuration. Therefore, it would have been obvious to one of ordinary skill in the art to have utilized the protective coating layers of Juric et al in the conventional aluminum electrowinning cell because the protective layers provided an enhanced lifetime to the cathodes.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Harry D Wilkins, III
Primary Examiner
Art Unit 1742

hdw